

# NEW PLANTS FROM PAPUASIA. NOVELTIES FROM THE LAKEKAMU AND BISMARCK-RAMU EXPEDITIONS

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## ABSTRACT

Two species are formally described from the 1996 survey of the Lakekamu basin. The new plants are *Medinilla sapoi-riverensis* (Melastomataceae) and *Trichospermum stevensii* (Tiliaceae). *Medinilla bismarck-ramuensis* is described from the 1995 biological survey of the Bismarck-Ramu tract. Taxonomic and ecological notes are provided with the diagnoses.

## ABSTRACT (MELANESIAN TOK PISIN)

Wanpela wok bus painimaut kamap pinis long ples Lakekamu, long Oktoba 14 igo Novemba 12, 1996. Dispela wok i kamapim tupela liklik diwai we i nupela samting olgeta. Lain saientis givim ol nem olsem: *Medinilla sapoi-riverensis* na *Trichospermum stevensii*. Narapela nupela samting kamapim long graun long Bismak-Ramu, na nem bilong dispela em i *Medinilla bismarck-ramuensis*.

## INTRODUCTION

The Lakekamu basin was botanically surveyed between October 14 and November 12, 1996, as part of a general biological assessment organized by Conservation International and the Foundation for People and Community Development. The survey territory is regarded as one of Papua New Guinea's 16 terrestrial unknown areas (Sekhran & Miller 1995: 114) and is also ranked among the highest value sites for biodiversity preservation in Papuasias (ibid: 121). A synopsis of scientific results from the expedition was previously published (Mack 1998). The present paper provides a formal description for two of the plants listed as new species in the earlier publication (Takeuchi & Kulang in Mack 1998).

A third species (*Medinilla bismarck-ramuensis*) is described from an expedition reviewed by Hedemark et al. (1997) and Takeuchi (1999).

## DESCRIPTION OF NEW SPECIES

### MELASTOMATACEAE

***Medinilla bismarck-ramuensis*** Takeuchi, sp. nov. (Fig. 1). TYPE: PAPUA NEW GUINEA. WESTERN HIGHLANDS PROVINCE: Bismarck Range, Mt. Oibo, ridgeline

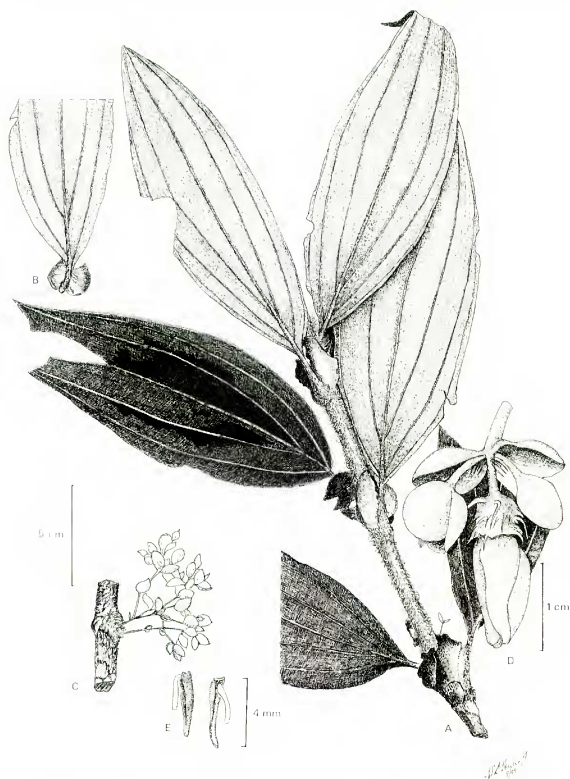


FIG. 1. *Medinilla bismarck-ramuensis* Takeuchi. A. Vegetative habit. B. Leaf and perianth auricles. C. Inflorescence: flowers obscured by bracts. D. Cyme. E. Major stamen; perspectives from the bud. Drawn from the type by N.H.S. Howcroft.

near 'Camp 1,' GPS 05° 35.513' S, 144° 47.252' E, elev. 2,357 m, 4 Oct 1995 (fl), W. Takeuchi 10,408 (HOLOTYPE: LAE; ISOTYPES: A, K, L).

*Medinilla schlechteri* Mansfeld et *M. mansfeldianae* Merrill & Perry affinis sed abiea petiolis auriculatis differt.

Erect epiphytic shrub to 2 m in height. *Branchlets* robust, terete, obliquely ascending, indumentum setiform, spreading or subappressed,  $\pm$  dense; nodal innovations crowded, setose, acroscopic, 10 mm long, glabrous and smooth or at most obscurely plumulose near the base. *Leaves* isomorphic; blades fleshy or coriaceous, elliptic or broadly lanceolate, 13.8–20.0 cm  $\times$  4.3–9.0 cm, apex acute or gradually acuminate, base equal, cuneate to obtuse, margin entire, not or hardly reflexed, lamina epunctate, bichromatic, adaxial surface dark opaque green, abaxially pale purple-suffused, bifacially alveolate in sicco; venation 5–7 plinerved, ventrally prominulous, more or less channelled, raised dorsally and distinctly purple, the lateral pairs of veins diverging from at most 22 mm above the base, at first subsericeous, progressively setose towards the petiole, later glabrate on the mature lamina, reticulating nerves invisible; petioles to 25 mm long, setose, proximally alate, the wings paired, auriculiform, to 31 mm  $\times$  15 mm, foliaceous, the margins usually entire, rarely erulose, surfaces purple and glabrous. *Inflorescence* dichasial, 2–12 cm long, solitary or fascicled, variably inserted, infrafoliar and lateral to cauline, occasionally from the axils of attached leaves, all parts dark reddish-purple except for the corolla, rachises cernuous, terete, not or only sparingly branched, setulose at nodes, glabrous in between, conspicuously and persistently bracteate; bracts geminate, orbicular, ca. 8 mm broad, involute, infrequently with margins distantly fimbriate, surfaces glabrous, venulose, nervation anastomosing; pedicels 3–4 mm, subtended by paired bracteoles. *Flowers* (measurements from spirit-preserved material) acute in bud; hypanthium setose, cupuliform-ovoid, typically 5 mm  $\times$  4–5 mm, margin denticulate or irregularly notched; corolla 5-merous, choripetalous, white, imbricate, petals 13 mm  $\times$  9 mm, asymmetric; stamens 10, glabrous, isomorphic but of differing lengths, 5 long stamens alternating with 5 short ones, the longer outer stamens: filament ca. 2.3 mm, anthers ca. 4.1 mm; shorter inner stamens: filament ca. 1.9 mm, anthers ca. 3.0 mm; all stamens with anthers at first inwardly retrorse and contiguous with the filament, dorsally ecalcarate or nearly so, ventral appendages minute; style 7–8 mm long, glabrous, cylindrical, apically tapering, stigma discolorous and punctiform. *Fruits* not seen.

*Distribution and ecology*.—*Medinilla bismarck-ramuensis* is known only from montane forests in Western Highlands and Morobe Provinces. The type was found as scattered plants in fog-swept clearings, growing on mossy stumps and logs.

*Etymology*.—The new species commemorates the 1995 Bismarck-Ramu expedition.

PARATYPE. PAPUA NEW GUINEA. MOROBE PROVINCE: Aseki Patrol Area near Haumga, elev. 5,900 ft (1,800 m), 4 Apr 1966 (fl), L.A. Craven & R. Schodde 1157 (A, CANB, K, L, LAE).

*Medinilla* is comparable to *Cyrtandra* in its pattern of endemic diversification. Even at the time of the first revision of Papuasian taxa (Mansfeld 1925), *Medinilla* was already one of the larger woody genera, with a conspectus of 53 species. Merrill and Perry (1943) later added 16 species using a key patterned on Mansfeld. Baker (1916), Ohwi (1943), and Bakhuizen (1943) also contributed species from the Wollaston expedition, the Kanehira-Hatusima collections, and Dutch New Guinea, respectively. Numerous contemporary gatherings cannot be accommodated by these earlier contributions, suggesting that the number of undescribed species is substantial.

In Mansfeld (1925: 115–18) the new species will key to *M. schlechteri* Mansfeld. Unlike most treatments from the 'Beiträge zur Flora von Papuasien' series, Mansfeld's key is written in Latin rather than German. Although outdated, Mansfeld's treatment still stands as the most comprehensive available account. *Medinilla bismarck-ramuensis* can be inserted into the couplet train at species 50, in the following manner:

Folia supra glabra, subtus nervis pilis nonnullis vestitis

Petiolus auriculatus: ..... *Medinilla bismarck-ramuensis* Takeuchi

Petiolus non auriculatus: ..... *Medinilla schlechteri* Mansfeld

In Merrill and Perry (1943: 427–28), *M. mansfeldiana* Merrill & Perry is the closest match to the new species, but the longer and manifestly auricled petioles on *M. bismarck-ramuensis* are distinctive. The novelty's affinity is actually to a group consisting of four species (fork G, *ibid.*: 427).

*Medinilla bismarck-ramuensis* may be connected to the complex characterized by persistent bracts and bracteoles, and regarded by Merrill and Perry (*ibid.*: 422) as comprising a distinct section. In Papuasias, this alliance is characteristic of the archipelagic stations from New Britain to the Solomons and (unlike the new species) is usually markedly anisophyllous. It was not previously thought to occur on the New Guinea mainland.

***Medinilla sapoi-riverensis* Takeuchi, sp. nov. (Fig. 2).** TYPE: PAPUA NEW GUINEA. GULF PROVINCE: Lakekamu, near Sapoi River, first ravine on the track above Ivimka Research Station, 07° 44' S, 146° 30' E, elev. 183 m, 22 Oct 1996 (fl, fr), W. Takeuchi & J. Kulang 11,398 (HOLOTYPE: LAE; ISOTYPES: A, BISH, BRIT, CANB, K, L).

*Medinilla warica* Mansfeld similis sed inflorescentiis non terminalibus.

Epiphytic shrub, ascending or with branches extended and hanging. *Stems* quadrangulate, tetrapterous, weak, hollow, surfaces green, minutely and distantly stellate-furfuraceous on apical intervals, older parts glabrous and pustulate, nodal innovations light-brown setose, 15–25 mm long, the youngest ones

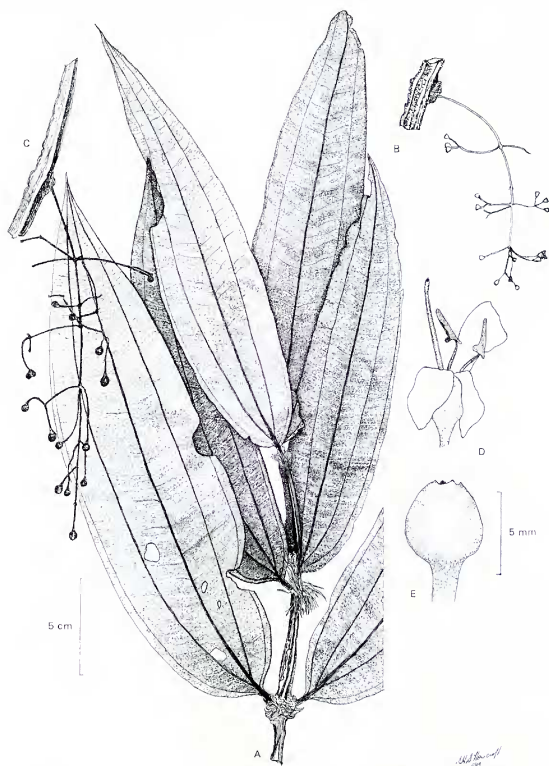


FIG. 2. *Medinilla sapoi-riverensis* Takeuchi. A. Vegetative habit. B. Immature infructescence. C. Mature infructescence. D. Flower, showing 3 petals, 2 stamens, and the style; other parts removed for clarity. E. Fruit. Drawn from the type by N.H.S. Howcroft.

somewhat plumulose but with the hairs fugacious. *Leaves* equal, obliquely diverging; blades linear-elliptic or narrowly lanceolate, subcoriaceous, 2.3–3.3 cm  $\times$  5.2–8.0 cm, adaxial surfaces opaque green, abaxially pale green; apex attenuate, prolonged into a filiform cauda or not, margins reflexed, base cuneate to obtuse, lamina reddish-purple in flush, initially stellate-pubescent on veins, glabrous when mature; venation 5-plinerved, the lateral pairs diverging from less than 12 mm above the petiole, raised on both sides, tertiary nervation transversal, scalariform, ventrally prominulous, dorsally less apparent; petiole 8–15 mm long, glabrescent. *Inflorescence* ramigerous, paniculiform, ultimately cymose, lax, pendulous, 10–18 cm long, ternate or quaternate on the first order ramification, lateral branches to 4 cm long, all axes nitid, red, flaccid, delicate, inconspicuously and stellately pubescent, eventually glabrate; floral bracts linear, persisting, hardly visible; pedicels 1–3 mm long. *Flowers* (measurements from spirit-preserved material): hypanthium cylindric to narrowly ovoid, 3.0–3.5 mm  $\times$  2.5–2.8 mm, margin truncate or 4-denticulate, exterior surfaces light green, at first very sparsely lepidote like the pedicel, glabrate at anthesis; corolla 4-parted, acute in bud, petals pink, reflexed, ecostate, asymmetric, distally oblique, apiculate, 4.0 mm  $\times$  2.5–2.8 mm; stamens 8, equal, glabrous, filaments 2.3–2.6 mm long, apically attenuate, anthers 1.9–2.0 mm long, distinctly calcarate and bi-appendiculate, dorsal spur ca. 0.4 mm long, linear, basally directed, ventral appendages lobulate, introrsely projecting, deltoid, ca. 0.2 mm long; style 6.5–6.9 mm long, stigma discolorous and punctiform, receptive surface obscurely papillate. *Fruit* globose, 5–6 mm in diameter, baccate, polyspermous, exocarp green turning black when ripe; seeds oblongoid, 1.0–1.2 mm  $\times$  0.5 mm, testa pale, verruculose.

*Distribution and ecology*.—Known with certainty only from the type locality. *Medinilla sapoi-riverensis* is infrequent in natural growth foothill forest, favoring mainly the wetter sites afforded by dark draws and gullies, especially near flowing creeks with closed overstories. It is shade-loving and does not occur in seral situations. A collection from Western Province (Henty *et al.* in NGF 42788) may be *M. sapoi-riverensis*, extending its range further west towards the border with Irian Jaya. The vegetative characters are consistent with the new species, but the specimen lacks the fertile structures required for reliable identification.

*Etymology*.—*Medinilla sapoi-riverensis* is named after the type locality in the Lakekamu basin.

*Medinilla sapoi-riverensis* is distinguished by its elongate leaves and quadrangular-alate branchlets. Other salient characters are the lax, pendulous inflorescences with verticillate branching. Innovations are setose at older nodes and only caducously plumulose in the apical tufts.

*Medinilla sapoi-riverensis* keys to *M. warica* Mansfeld (Mansfeld 1925) but

the latter species has a terminal inflorescence. There is also an apparent affinity to *M. mansfeldiana* Merrill & Perry, and *M. schlechteri* Mansfeld. The new species differs from *M. mansfeldiana* by the nature and density of the indumentum, length of the inflorescence, and size of the bracts. From *M. schlechteri*, it differs in having clearly petiolate leaves, smaller bracts, and esetose calyces.

## TILIACEAE

***Trichospermum stevensii* Takeuchi, sp. nov. (Fig. 3). TYPE: PAPUA NEW GUINEA.**

GULF PROVINCE: Lakekamu, Sapoi River, streambanks near base camp, 07° 44' S, 146° 29.5' E, elev. 105 m, 7 Nov 1996 (fl bud, fr, xylarium collection), *W. Takeuchi & J. Kulang* 11.589 (HOLOTYPE: LAE; ISOTYPES: A, BISH, BRIT, CANB, K, L).

*Folia* subter consperce stellato-pilosa et costa media nervisque minute stellato-lepidotis differt.

Small tree to 8 m tall. *Stem* without buttress or basal swell, exterior surfaces pale grayish-brown, unfissured, not lenticellate; bark thick, fibrous, extractable in flexible strips or plates; wood white, weak, very light in weight. *Branchlets* flexuous, terete, sparingly mucilaginous from cut surfaces, pithy, indumentum stellate, squamulate, scales dark brown, at most 0.3 mm diameter, coarsely-armed, crowded, occasionally accompanied by larger ascending hairs especially at the stem apices. *Stipules* caducous or persisting through several nodes, oblong-ovate, typically 10 mm × 4 mm, rarely to 14 mm × 10 mm, foliaceous, yellow-green, cordately-based or auriculate, proximally and laxly provided with indumentum like the branchlets, otherwise glabrescent. *Leaves* distichous, membranaceous, adaxially dark dull green, abaxially medium green and marked by opaque punctulations, ventral surfaces puberulous, the hairs simple or stellate, following veins, dorsal surfaces stellate-pilosulous, hairs 4–8 armed, ascending, processes short, ca. 0.2 mm long, the midrib also provided with a secondary indumentum of smaller appressedly stellate scales; mature blades oblong, weakly constricted near the middle, 22–32 cm × 10.5–14 cm; apex long-acuminate, more or less abruptly developed, the acumen 2.0–3.5 cm long; leaf margins entire to the naked eye, remotely and minutely toothed under magnification, serrulations glandular-thickened from excurrent nervules; leaf base truncate or more commonly broadly cordate, the sinus when present to 1.5 cm deep, basal glands marginal, occurring as linear callosities flanking the petiole insertion; lateral veins 7–9 above a basal nervation, often in opposite pairs, acutely diverging (ca. 45° from the midrib), generally straight, ending in commissural looping nerves or not, major veins plane or hardly raised ventrally, dorsally prominulous and with primary axils stellately comose, higher order axils clear, intercostals obliquely scalariform, tertiary venation lax; petiole 14–25 mm long, unchannelled, indumentum as the branchlets. *Inflorescence* axillary, to 8.5 cm length, axes texturally scabrid, variably covered by stellate scales and occasional interspersed hairs, rachides unequal, often fractiflex,



FIG. 3. *Trichospermum stevensii* Takeuchi. A. Flowering branchlet. B. Mature leaf. C. Vegetative branchlet and stipules. D. Infructescence. E. Dehiscent fruits. F. Detail of capsule from side. G. Capsule hairs, showing the 2 stellate types discussed in the text. Drawn from the type by N.H.S. Howcroft.



bifurcate or ternate at the first branch, ultimately cymose, peduncle 5–30 mm long; bracts deciduous, free, linear-acuminate or ligulate, usually 2–3 mm long, sparsely stellate-hairy, the cymes subtended by 6 bracteoles. *Flowers* not seen at anthesis, immature buds (all measurements from rehydrated material) ovoid to subglobose, 4.5–5.5 mm  $\times$  5.5–6.0 mm, yellow-green; sepals 5, valvate, fleshy, ovate, 5 mm  $\times$  3 mm, outer surfaces coarsely and minutely stellate-hairy, inside non-stellately pilosulous with submoniliform hairs; corolla included, imbricate, 5-choripetalous, chartaceous, reticulately venose, elliptic to oblong, ca. 4 mm  $\times$  2 mm, dorsally with indumentum like the contiguous calycine surface, ventrally glabrate; androecium polyandrous, congested, glabrous, anthers medifixed, arcuate; ovary compressed, pulverulent, style 4-lobulate; receptacle pilose; pedicels ca. 1.5 mm long. *Capsules* 2-celled, loculicidal, polyspermous, distinctly broader than long, 13–15 mm  $\times$  20–23 mm, compressed but with otherwise weakly inflated lobes, summit retuse, style persisting, capsular base obscurely stipitate, androecium residue present on the fruit, valves 2, thin-crustaceous, marginate, brownish-green turning black after seed dispersal, persistently and basally connate, inside glabrous, smooth or intermittently striate, outside somewhat harshly tomentulose, the indumentum stellate, dimorphous, bilayered, the larger hairs lax, 4–8 armed, processes 0.5–1.0 mm long, radiate, underneath with a congested layer of coarse scales 0.3 mm diameter. *Seeds* obovate or oblanceolate, dorsally convex and ventrally  $\pm$  cotyloid, ca. 1.4 mm  $\times$  1.0 mm, testa brown, shaggy-fimbriate on equatorial margins, fimbriae fulvous, 3–4 mm long.

*Distribution and ecology.*—*Trichospermum stevensii* is thus far known only from lowland rainforests of Gulf Province. The new species is characteristic of regrowth environments such as gaps, landslides, forest margins, and surge zones along open streambeds. It is most commonly seen in association with various species of *Macaranga*, or as a co-dominant in early riverine successions. Nearly all sightings were in sterile condition during the survey.

*Etymology.*—The new species is named after Professor P.F. Stevens, an authority on the Malesian flora and a specialist in Ericaceae and Clusiaceae.

**PARATYPE.** PAPUA NEW GUINEA, Gulf Province: subdistrict Baimuru, above Purari River, 63 km at 65° from Baimuru, 07° 15' S, 145° 20' E, elev. 240 m, 26 Mar 1974 (fr. wood), J.R. Croft *et al.* in LAE 61143 (A, BRI, CANB, K, L, LAE).

In Kostermans' (1972) revision of *Trichospermum*, *T. stevensii* arguably keys closest to the extra-Papuan *T. morotaiensis* Kosterm. and *T. fusbbergii* Kosterm. Although Kostermans' reliance on underleaf indumentum is useful for primary separations, *Trichospermum stevensii* falls between the cracks on the first order couplets. It is nearest to fork 1c (*ibid.*: 405–406) but the combination of dorsal scales with scattered, erect hairs is not covered by any of the prin-

cial leads. The strictest solution for integration into the existing key is to introduce another descriptor for the new species, as follows:

- 1f. Lower leaf surface squamulate on costae, and with scattered, erect stellate hairs on intervenia and higher order nervation ..... *T. stevensii* Takeuchi

If the underleaf hairs on the new species are generously interpreted, it can be forced into Kostermans' conspectus, in which case an apparent connection to *T. morotaiensis* and *T. fosbergii* will emerge. Substantive distinctions in leaf and capsule size would still provide separation against the preceding taxa. Among Papuanian representatives, *T. stevensii* appears close to *T. tripyxis* (K. Schum.) Kosterm., but the latter species has trivalved capsules. The compressed bivalved fruits of *T. stevensii* also suggest affinity to *T. peekelii* Burret, but the indumentum is clearly inconsistent with that species. The type collection has branchlets with appressed stellate scales rather than the erecto-patent vestiture on most Papuanian taxa.

The bast of *Trichospermum stevensii* is very resilient; the entire bark is stripped in sheets from the trunk and the resulting mats applied as flooring by Lakekamu villagers. Other species of *Trichospermum* are noted for their fiber value (ibid: 403).

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